Claims

We claim:

1. A coform nonwoven web having a substantially uniform structure comprising

a plurality of substantially continuous multicomponent thermoplastic filaments; and

a second material selected from the group consisting of fibers, particles, and a mixture of fibers and particles, wherein the second material is substantially uniformly dispersed within the multicomponent thermoplastic filaments in the z-direction of the coform nonwoven web.

2. The nonwoven web of claim 1, wherein the second material comprises an absorbent material selected from the group consisting of absorbent fibers, absorbent particles and a mixture of absorbent fibers and absorbent particles.

3. The nonwoven web according to claim 2, wherein the multicomponent thermoplastic filaments comprise about 1 to about 95% by weight of the nonwoven web and the absorbent material comprise 5 to about 99% by weight of the nonwoven web.

4. The nonwoven web according to claim 3, wherein the multicomponent thermoplastic filaments comprise about 2 to about 50% by weight of the nonwoven web and the absorbent material comprise about 50 to about 98% by weight of the nonwoven web.

5. The nonwoven web according to claim 4, wherein the multicomponent thermoplastic filaments comprise about 5 to about 30% by weight of the nonwoven web and the absorbent material comprise about 70 to about 95% by weight of the nonwoven web.

6. The nonwoven web according to claim 1, wherein the multicomponent polymer comprises a polymer component selected the group consisting of polyethylene, polypropylene, polybutylene, fluropolyolefins, high pressure branched low density polyethylenes, linear low density polyethylenes having an alpha-olefin comonomer content more than about 10% by weight, copolymers of ethylene with at least one vinyl monomer, copolymers of ethylene with unsaturated aliphatic carboxylic acids or derivatives thereof, copolymers of any two alpha-olefins having 2-20 carbon atoms wherein the content of each of the two comononers exceeds 10% by weight of the copolymer, thermoplastic polyurethanes, A-B and A-B-A' block copolymers where A and A' are thermoplastic end blocks and B is an elastomeric block, polyamides, polyvinyl acetates, saponified polyvinyl

acetates, saponified ethylene vinyl acetates, and mixtures thereof; and a second polymer component selected the group consisting of polypropylene homopolymers, polypropylene copolymers containing up to about 10% ethylene or another C_4-C_{20} alpha-olefin comonomer, high density polyethylenes, linear low density polyethylenes in which the alpha-olefin comonomer content is less than about 10% by weight, polyamides, polyesters, polycarbonates, polytetrafluoroethylenes, and mixtures thereof.

7. The nonwoven web according to claim 2, wherein the multicomponent filaments are a bicomponent polymer.

8. The nonwoven web according to claim 2, wherein the mutlicomponent filaments have a core/sheath or a side-by-side configuration.

9. The nonwoven web according to claim 8, wherein the multicomponent filaments have an A/B/A side-by-side configuration.

10. The nonwoven web according to claim 1, having a density in the range of about 0.01 g/cc to about 0.5g/cc.

11. The nonwoven web according to claim 1, having a density in the range of about 0.05 g/cc to about 0.2g/cc.

12. The nonwoven web according to claim 2, comprising a horizontal wicking distance of at least 70 mm per 30 minute time period.

13. The nonwoven web according to claim 2, wherein the absorbent material comprises pulp.

14. The nonwoven web according to claim 2, wherein the absorbent material comprises a superabsorbent fiber or particle.

15. The nonwoven web according to claim 14, wherein the absorbent material further comprises pulp.

16. The nonwoven web according to claim 15, wherein the superabsorbent material is present in an amount less that about 50% by weight, based on the total weight of the absorbent material in the nonwoven web.

17. The nonwoven web according to claim 16, wherein the superabsorbent material is present in an amount between about 5 and 25 % by weight, based on the total weight of the absorbent material in the nonwoven web.

18. The nonwoven web according to claim 1, further comprising an essentially vertical layering lay-down structure.

19. The nonwoven web according to claim 1, wherein the substantially continuous multicomponent filament comprises an A/B/A side by side filament in an amount between about 5 and 30 % by weight of the absorbent nonwoven web, comprising, as the A polymeric component, a polymer selected from the group consisting of polyethylene, a fluoropolyolefin and polybutylene, and, as the B polymeric component, a polymer selected from the group consisting polyethylene, polyester or nylon; the absorbent material comprises pulp and is present in an amount between 70 and 95% by weight of the absorbent nonwoven web.

20. An absorbent article comprising the nonwoven web of claim 1.

21. A method of preparing the nonwoven web having a substantially uniform structure comprising a plurality of substantially continuous multicomponent thermoplastic filaments; and a second material selected from the group consisting of fibers, particles, and a mixture of fibers and particles, wherein the second material is substantially uniformly dispersed within the multicomponent thermoplastic filaments in the z-direction of the coform nonwoven web, said method comprising

a. providing a first die;

b. extruding liquefied resin components of the multicomponent thermoplastic filaments through a plurality of orifices in the first die in the direction of a first axis;

c. attenuating the liquefied resin component of the multicomponent thermoplastic filaments into a plurality of discrete filaments by subjecting the liquefied resin components to a first fluid stream directed in the direction of the first axis along both sides of the orifices, wherein the orifices are locate adjacent to the first fluid stream, the first fluid

stream has a fluid pressure and the first fluid stream is perturbed by varying the fluid pressure of the first fluid stream on both sides of the orifices;

d. introducing the second material into the first fluid stream to form a mixture of multicomponent thermoplastic filaments and second material; and

e. depositing the mixture onto a forming surface to form a coform nonwoven web.

22. The method of claim 21, further comprising compacting the formed coform nonwoven web.

23. The method of claim 22, further comprising heating the formed absorbent nonwoven web before compacting the formed coform nonwoven web.

24. The method of claim 21, wherein the fluid stream along both sides of the orifices comprises at least two fluid streams in a coflowing arrangement, wherein at least one of the fluid streams on both sides of the orifice is perturbed.

25. The method of claim 24, wherein at least one stream comprises a cold air stream having a temperature below the melting point of the polymers used to prepare the multicomponent filaments and at least one stream comprises a hot air stream having a temperature sufficient to prevent premature quenching of the liquefied resin components of the forming multicomponent filaments.

26. The method of claim 25, wherein the temperature of the cold air stream is at least 300° F below the temperature of the hot air stream.

27. The method of claim 26, wherein the cold air stream is perturbed.

28. The method of claim 26, wherein the cold air stream is perturbed by a high speed rotary valve.

29. The method of claim 21, wherein the fluid stream is perturbed by a high speed rotary valve.

30. The method of claim 21, further comprising

a'. providing a second die;

b'. extruding liquefied resin components of the multicomponent thermoplastic filaments through a plurality of orifices in the second die in the direction of a second axis;

c'. attenuating the liquefied resin component of the multicomponent thermoplastic filaments into a plurality of discrete filaments by subjecting the liquefied resin components to a second fluid stream directed in the direction of the second axis along both sides of the orifices of the second die, wherein the orifices of the second die are located adjacent to the second fluid stream, the second fluid stream has a fluid pressure and the second fluid stream is perturbed by varying the fluid pressure of the second fluid stream on both sides of the orifices of the second die;

wherein the first and second fluid streams converge to form a converged fluid stream and the second material is introduced into the converged fluid stream.

31. The method of claim 30, wherein the second material is introduced to the converged fluid stream via a chute located between the first and second dies.

32. The method of claim 30, further comprising compacting the formed coform nonwoven web.

33. The method of claim 32, further comprising heating the formed nonwoven web before compacting the formed coform nonwoven web.

34. The method of claim 30, wherein the first fluid stream along both sides of the orifice of the first die and the second fluid stream along both sides of the orifice second die comprises at least two streams in a coflowing arrangement, wherein at least one of the streams on both sides of each orifice is perturbed.

35. The method of claim 34, wherein at least one stream on each side of each orifice comprises a cold air stream having a temperature below the melting point of the polymers used to prepare the multicomponent filaments and at least one stream on each side of each orifice comprises a hot air stream having a temperature sufficient to prevent premature quenching of the liquefied resin components of the forming multicomponent filaments.

36. The method of claim 35, wherein the temperature of the cold air streams are at least 300° F below the temperature of the hot air streams.

37. The method of claim 35, wherein the cold air streams are perturbed.

38. The method of claim 35, wherein the cold air streams are perturbed by a high speed rotary valve.

39. The method of claim 21, wherein the second material comprises an absorbent material selected from the group consisting of absorbent fibers, absorbent particles and a mixture of absorbent fibers and absorbent particles.

40. The method of claim 30, wherein the second material comprises an absorbent material selected from the group consisting of absorbent fibers, absorbent particles and a mixture of absorbent fibers and absorbent particles.